Offices of the Executive Engineer,
Electricity Department, Division – XII, Xeldem, Quepem Goa.
Ph: -2662646, 2662343, Fax: -2662343. Email: - exengr12@redifmail.com

"Under certificate of posting"

No.EF-XII/Quot-09(19-20)/8952019-20 Date: -18/10/2019

To,

Sub:-Quotation for Supply of Modem for Automatic Meter Reading.

Sirs,

The Executive Engineer Elect. Div-XII, Xeldem-Goa, on behalf of Governor of Goa invites you to offer your lowest rate for Supply of below mentioned Materials as per the terms and condition (Annexure-I) enclosed here with:-

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Description</th>
<th>Quantity</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Modem for Automatic Meter Reading</td>
<td>26 Nos.</td>
<td></td>
</tr>
</tbody>
</table>

Completion of Work : 30 days Date of opening: 04/11/2019

E.M.D. Rs. 36821-

Yours faithfully,

Executive Engineer,
Div XII – Xeldem.
ANNEXURE-I

TERMS & CONDITIONS

1) RATES: The rates quoted should be firm & for Supply at Xeldem Sub-Station.

2) TAXES & DUTIES: The rates quoted shall be inclusive of GST, transportation, octroi, levies, packing & forwarding etc.

3) VALIDITY: The rates quoted shall be valid for a period of 60 days from the date of opening of quotation.

4) COMPLETION PERIOD: The Supply of material shall be completed within 30 days from the date of placement of order.

5) EARNEST MONEY DEPOSIT: An amount towards EARNEST MONEY DEPOSIT shall be furnished by demand Draft drawn from any scheduled bank guaranteed by Reserve Bank of India, payable at Quepem in favour of the Executive Engineer, Div XII, Electricity Department, Xeldem-Goa in the envelope marked as “Envelope A”. The said envelope should be stapled to the quotation/offer enclosed in a separate envelope marked as “Envelope B” with the enquiry reference no superscribed on it. The quotation received without EMD will be summarily rejected.

The Government shall, without prejudice to any other right or remedy, be at liberty to forfeit 50% of the EMD, if any quoter, whose quotation is accepted, fails to commence the work/supply specified in supply order within the prescribed time or abandons the supply before its completion.

6) PERFORMANCE SECURITY: Performance Security of 5% of the ordered value shall be deposited with this office on issue of acceptance letter & the same shall be refundable on completion of the work & recording of the completion certificate.

7) SECURITY DEPOSIT: Security Deposit amounting to 2.5% of the ordered value will have paid by you or the same shall be deducted from the bills after adjusting the EMD paid by you. The Security Deposit will be retained till the expiry of the guarantee period & thereafter the same shall be refunded against an application in Form-28, subject to the condition that defects in the material noticed during the guarantee period will be replaced by you at your own cost to the entire satisfaction of the Engineer-in-charge and on the recovery of any amount due to the Government, recovered from you will be refunded after the expiry of the guarantee period on receiving written request from you however, if any recovery is to be made from you for sub-standard material, short supply etc., or any other reason against this order, the same will be recovered from this security deposit amount.

8) PAYMENT: Payment will be made only after supply of material in full & good condition and on acceptance by Engineer-in-charge. The contractor shall indicate Income Tax, Pan Number & TIN Number registered with the Collectorate of Custom & Central Sales Tax in the invoices/receipt, Bank a/c No., Name of Bank, IFSC code, MICR code, mobile No., e-mail address etc. for e-payments without which payment will not be released.

9) CONTRACT CONDITION: Orders will be governed by the conditions of P.W.D. agreement Form No. 9. Your acceptance for the same should be confirmed.

10) COMPENSATION: For all the late supply of materials, a compensation at the rate of 1% of the order value per day of delay in completion beyond the schedule delivery date mentioned above but not exceeding 10% of the order value will be charged.

11) GUARANTEE: The Supplied Materials will have to be guaranteed for satisfactory performance the period of 12 months from the date of Supply.

12) THE RIGHT TO REJECT: The right to reject any or all the quotations, without assigning any reasons shall rest with the undersigned.

13) DATE OF RECEIPT AND OPENING OF QUOTATION: The quotation will be received up to 15.00hrs on 04/11/2019 and it will be opened at 15.30hrs on the same day.

[Signature]
Executive Engineer,
Div XII – Xeldem.
The Chief Electrical Engineer.....for information and displaying on their notice board and hosting the detail tender on the official website of Elect. Dept., Govt. of Goa by 24/10/2019

2. The Superintending Engineer, Elect. Circle-I(S)/ II(N), Margao / Panaji... for information and displaying on their notice board

3. The Executive Engineer, Elect. Div. I / II / III / IV / V / VI / VII / VIII / IX / X / XI / XIII/XIV / XV, Panaji / Margao / Ponda / Bicholim / Mapusa / Curchorem / Tivim / Ponda / Vasco/ Corlim / Verna..... for information and displaying on their notice board

4. The Divisional Accountant, Division – XII, Xeldem.

5. The Assistant Executive Engineer, Elect. S/D-I / II (EIV) / (Const.), Xeldem.

6. The Director of Information and Technology, 2nd floor, Alcon Construction, above Hyundai Show room, Porvorim Bardez Goa...With a request to publish the quotation on goa Government website by 24/10/2019 (e-mail of the notice sent to mngtit.goa@nic.in, dir-dit.goa@nic.in & sweng8- dit.goa@nic.in)

7. The Director, Printing & Stationary, Mahatma Gandhi Road, Panaji-Goa....with a request to publish in Goa Tender's bulletin (soft copy sent to e-mail ld dir-gpps.goa@nic.in)


Technical Specification of Common Automatic Meter Reading
GPRS 4G MODEM

The MODEM shall be an intelligent device connected to an Electronic Energy Meter by means of optical/RS232 port, installed at various consumer premises (HT/LT consumers) to collect the following data as per configured frequency/On demand.

a. Complete Meter data stored in the meter. (hourly/daily/weekly/monthly)
   - Instantaneous parameters, at the time of reading
   - Billing data, present & last 12 months’ histories
   - Load survey, 30 days/complete no. of days stored
   - Tamper data, Settings/Configuration data

b. Instantaneous parameters. (every 15/60 minutes /daily)

The 4G failover 3G/2G MODEM at consumer meter end should have suitable interface facility to connect with the meter by using the RS 232 cable. The MODEM shall also be retrofitted on optical port/RS232 port of the meter.

1. Key Features:
   Compatible with various standard DLMS compliant Meters like Secure, L&T, Genus & various other meters Shall have meter detect and meter data read feature which enables communication with all popular Indian energy meters including DLMS meters using built-in meter specific protocol stack.

1. The modem at the consumers’ end shall have a suitable interface facility to connect with meter by using RS232/RJ11 cable. If required, modem may also be retrofitted on optical port of the meter.

2. The modem shall be capable of operating on the power drawn from the meter input itself. Auxiliary power supply will not be acceptable. The modem shall have three phase AC input supply and should be capable of proper functioning within the power supply range of 77 AC P-P to 470V AC P-P, 50 Hz so that same modem shall be used for DTR meters, HT and LT Tri-vector meters. However, the modem should also be capable of operating on single phase 230V, 50 Hz power supply. The modem shall be suitably protected against surge of 6KV. Average Power consumption of the modem shall not be more than 3.5 VA under idle and during data transfer. Surge capacity of 6 kV required certificate issued by any Govt. body/NABL accredited lab is to be produced in this regard.

3. The modem shall be capable to transfer the entire data in 5 minutes after connection is made.

4. SIM card holder, modem cover and body shall have arrangement for sealing. Modem shall be rugged, compact and reliable in design

5. Modem shall be capable of operating with SIMs of any service provider available in the area.

6. The modem shall have flexible external antenna to enable placement of the antenna at the location of strongest signal inside the metering cubicle. Below are the antenna features: - 1. 6dBi Spiral Antenna 2. 3dB Finger Type Antenna (Optional)

7. The modem shall be an intelligent modem with store and transfer facility. It shall also have diagnostic feature to check & transmit Network Strength

8. Modem shall be capable of working for 24 hours every day under the field conditions. Should have remote start/ stop and restart feature
9. GPRS Data Transmission Features:
   - Multi Slot Class 12 or Multi Slot Class 10
   - Mobile Station Class B
   - Modulating and Coding Schemes: MCS 1 to 9
   - Packet Channel Support: PBCCH
   - Dial Band GSM/GPRS 900/1800 Mhz
   - GPRS between modem and data centre should be more than 40 kbps
10. SMS Features: - 1. Point to Point MO and MT 2. SMS Cell Broadcast. Text and PDU Mode 3. Whitelisted
11. LED Status Indicators
12. Environmental Specs: - Operating Temperature: -20°C to +60°C Storage Temperature: -40°C to +80°C
13. The modem firmware shall be reprogrammed from server remotely
14. Modem shall be auto configurable by itself to the different makes of meters, i.e. plug & play. Modem shall be compatible with various standard DLMS compliant Meters & legacy version meters viz. electronic meters etc.
15. Modem shall support pull model as well. In case of data is required from the MDAS end, then connection will be established from MDAS end to the device
16. When the GPRS modem is busy collecting the data from the meter and the request comes to get the data, then priority shall be given to request from MDAS end
17. In the event of an outage, the modem shall be able to send the outage alert to the MDAS
18. Modem should meet the following EMI/EMC specifications: Electrostatic Discharge IEC61000-4-2 Fast Transient Burst IEC61000-4-4 Surges Immunity IEC61000-4-5 Conducted emission as per IEC61000-3-2 Radiated emissions as per CISPR 22 Radiate Immunity as per IEC61000-4-3
19. The modem shall have sufficient memory to store resident software and data. The memory shall be scalable / upgradable.
20. The modem shall have non-volatile memory, so that the registered parameters will not be affected by loss of power
21. Modem shall have 10 MB non-volatile data memory
22. Modems shall be able to send outage alerts to MDAS which should send SMS alerts to operators as and when the alert is received
23. Shall have auto restart feature with built-in watchdog timers and intelligence
24. Shall have on-line tamper detection feature through which GPRS MODEM will continuously poll the meter for any new tamper and will send the event to the server and also to a set of pre-programmed mobile numbers as an SMS alert.
25. Shall have program over the air (POTA) feature which will reduce the manual field visits and also save project time and. The modem firmware shall be reprogrammed from the server remotely.
   - Remote start/stop and restart feature.
   - Auto recover feature in case modem / network hanging
   - Comprehensive self-diagnosis feature which will create log file with all at a periodicity and link check for communication.
   - On demand SMS request through SMS for Instantaneous Parameters
   - Real time outages, alarms as alerts to server and to configured mobile numbers Automatic GPRS connection (no AT commands required) and watchdog for reliable Communication.
   - Inbuilt 3 Phase Power supply as well as operational on single phase
   - Automatic pushing of meter data at configured regular intervals
   - On line monitoring of vital instantaneous parameters like voltages, currents energies, powers, power factors...
   - IP (internet protocol) based Communication, enabling simultaneous data access from thousands of GPRS Modems.
Shall use meter supported baud rate to read meter data and shall use maximum network supported baud rates to push the data to server.

- Shall have a configuration over the air feature through which all the GPRS MODEM operational settings will be configured.
- Shall have a configurable scheduled meter read and data transmit feature to enable grouping of the meters so that the loading on the server is equally distributed from all the field installed modems.
- Shall have selective on-demand meter read feature through which server can send an on demand request to modem to read the selective parameters from the meter.

2. Power Supply Section:
   2.1 Input specifications: - The offered GPRS MODEMs should be capable of operating on three phase supply drawn from the meter input itself. Auxiliary power supply will not be acceptable.
   2.2 Withstand capacity against surges should be according to Indian conditions i.e. 6.0 kV. 2.1.3 Input terminals: The power supply input shall be a suitable two core integrated cable coming out from AMR box.
   2.3 The GPRS MODEM shall have capability to work under continuous power on condition.

3. GSM/GPRS Section:
   The GSM/GPRS module shall comply with the following:
   3.1 The module shall operate in dual Band GSM 900/1800MHz.
   3.2 The module shall be compliant with ETSI GSM Phase 2+ Standard.
   - Class 4 (2W) @ 900 MHz
   - Class 1 (1W) @ 1800 MHz
   3.3 The module shall support Point-to-Point transmission and Cell Broadcast features.
   3.4 It shall have auto dial feature.
   3.5 Serial binary and suitable data format for data transfer.
   3.6 Short messaging service (SMS) features.
   - Text and PDU
   - Point to point (MT/MO)
   - Cell broadcast
   3.7 GPRS MODEM should support both data and SMS transmission.

4. SIM Card Section:
   4.1 For placing the SIM Card, a SIM Card Holder shall be provided on the motherboard and shall be accessible only by opening/sliding the cover, GPRS MODEM shall not be opened for replacing the SIM card.
   4.2 The SIM Card supported shall be of 1.8V/3V Interface.
   4.3 Interlocking facility shall be provided under the device cover.
   4.4 SIM card slot/cover shall be sealed to avoid access to unauthorized. The offered GPRS MODEM shall comply for ESD as per IEC61000-4-2.

5. Communication Interface & Capabilities:
   5.1 A RS232 Serial Link supporting up to 115,200 bauds with an auto-bauding option shall be provided. However, the data transfer rate for remote meter reading shall depend on meter compatibility.
   5.2 The RS232 output shall be provided on a 9-pin female//RJ11 connector which can be connected to electronic energy meter's optical / serial communication port through suitable communication cable.
5.3 The GPRS MODEM shall be suitably pre-configured for meter reading & transferring the data to the DC.
5.4 GPRS MODEM should be Quad band GPRS MODEM capable of operating at 900 and 1800 MHz GSM transmission.
5.5 GPRS MODEM should support both Data and SMS transmission. It should have both GSM and GPRS features.

6. RF section: -
A SMA interface shall be provided on the GPRS MODEM to which either a fixed or a wired (with magnetic base) Dual Band Built-in Antenna of minimum -6dbi gain can be connected. Provision shall also be made to connect 14dbi high gain external yagi antenna to improve poor signal strength.

7. Network Identification Section: -
For determining the health of the device an LED shall be provided on the GPRS MODEM which will depict the current functioning status (power up/registered in network/transmitting data).

8. Data Features for GSM/GPRS module:
Internet Services: TCP, UDP, HTTP, FTP GPRS Data transmission features: -
GPRS Class B Multi slot class 12 or class B Multi slot class 10
Packet channel support: PBCCH
Coding Schemes: CS1 to CS4 compliant with SMG32 (Release 97)

9. EMI/EMC Specifications: -
The GSM/GPRS MODEM shall meet the following EMI/EMC specifications:
   Electrostatic Discharge IEC61000-4-2
   Fast Transient Burst IEC61000-4-4
   Surges Immunity IEC61000-4-5
   Conducted Emission CISPR22 (class B)

10. Mechanical Specifications: -
The Mechanical Specifications of the GPRS MODEM shall be as follows:
   • GPRS MODEM shall be compact, as this device will be placed in a compact meter boxes,
   • Mounting Arrangement: Easy mounting arrangement with a hook provision on the GPRS MODEM supported with the screw fixing arrangement so that it will be comfortably fixed inside the meter Box.
   • The GPRS MODEM shall comply with IP55 rating.
   • Sealing Arrangement: The Top and Base Cover shall have a suitable sealing arrangement so that the GPRS MODEM cannot be tampered.
   • The GPRS MODEM shall be a compact model housed in a polycarbonate/ engineering plastic enclosure.

11. Environmental specifications: -
The GPRS MODEM shall meet the following environmental specifications:
   Storage Temperature: -20 degrees to +70 degree
   Operating Temperature: -0 degrees to +55 degree and
   Humidity: up to 95% RH (non – condensing)

12. Processor and Memory: -
Inbuilt ARM processor and 4MB Nonvolatile memory.
3. Functional specifications:

The GPRS MODEM should be an intelligent device and capable of providing the following functionalities on GSM/GPRS network:

- The GPRS MODEM should be capable for long duration data transfer to central station as per configuration via suitable GPRS MODEMR software.

When the GPRS MODEM is busy in collecting the data from the meter and the request comes to get the data, then priority shall be given to request from central station software.

- Power Outage Notification: In the event of an outage, the GPRS MODEM should be able to send the outage alert to Data center, there after SMS to predefined number to notify the outage event with date and time of occurrence/restoration.

The GPRS MODEM should be capable of operating with SIMs of local GSM/GPRS/Service provider in the area.

- GPRS MODEM should be capable for continuous working for 24 hours every day under field conditions, even when enclosed in Metering Cubicles at Consumer sites.

Software shall have facility for Auto-Scheduler to enable automatic/Unattended data collection during night hours.

14. Data transfer in push Mode:

By default, GPRS MODEM should be configured for push mode of data transfer i.e. GPRS MODEM shall automatically establish a session with Static IP of MDA Server at DC at specified time (once in an hour/day/week/month) for the purpose of meter reading through GPRS only. This configuration of the GPRS MODEM shall be configurable remotely.

- If GPRS MODEM could not establish connection to the Server placed at Data center at specified time, then it shall retry the same as configured.

15. Data transfer in pull Mode

- In case the data is required on demand from the Data center end (Server end), then connection shall be established from head end to the device.

- User shall have option to get the meter data available in the memory of intelligent AMR, invoke the Modem to read & upload the meter data.

- Provision to generate reports of successful automatic meter reading (AMR) Calls and unsuccessful AMR calls separately shall be provided.

- Provision for flexible scheduling of meter reading by AMR software automatically on a pre-defined hourly, daily, weekly or monthly basis.

- Provision shall be made to read the groups of energy meters in one go from the AMR software and the searchable by Meter number, or as a separate group.
<table>
<thead>
<tr>
<th>S. No.</th>
<th>Parameters/Features</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Operating GPRS Band</td>
<td>Quad Band GPRS/GSM/850/900/1800/1900MHz</td>
</tr>
<tr>
<td>2</td>
<td>Applications supported</td>
<td>Meter reading/Data storage/Data transfer/customized application support</td>
</tr>
<tr>
<td>3</td>
<td>Power output</td>
<td>Typically 2W @ 850/900 MHz, 1W @ 1800/1900 MHz</td>
</tr>
<tr>
<td>4</td>
<td>Power supply input</td>
<td>70 to 440VAC</td>
</tr>
</tbody>
</table>
| 5     | Ambient Temperature            | Storage temperature: -20°C to +70°C  
Operating temperature: 0°C to +55°C                                                                                                        |
| 6     | Humidity                       | 95% RH (non condensing)                                                                                                                     |
| 7     | Interfaces                     | RS-232 in the form of 9-pin connector for connection to electronic tri-vector meter                                                         |
| 8     | Data interface                 | GPRS                                                                                                                                         |
| 9     | Baud rate                      | 300 to 115200                                                                                                                              |
| 10    | Antenna                        | 0dB/3dB/10dB antenna or with screw mount/Wall mount arrangement. The actual requirement of these Modem Antennas of various gains may vary as per the requirement at site. |
| 11    | SIM Card holder                | Easy sliding arrangement and interlocking facility inside the CAMR, without opening the Modem Cover for replacement of SIM and shall have sealing provision for the SIM |
| 12    | VA Burden                      | <3.5VA                                                                                                                                      |
| 13    | Enclosing Box                  | Yes                                                                                                                                          |
| 14    | Mounting Arrangement           | CAMR with PC casing with hang & screw mount arrangement for back panel                                                                       |
| 15    | Typical Dimension              | 141 X 83 X 33mm +/- 1mm tolerance, compact design                                                                                            |
| 16    | Service Indicating LED         | 3 LEDs (one each for transmission and receiving of data and one for Network Status & Power status indication)                                |
| 17    | Rating                         | CAMR is capable for working under continuous power on condition                                                                          |
| 18    | Optical Port Connector: Cable  | Meter specific Optical cable or RS232 cable as per the Meters                                                                               |
| 19    | Surge withstand/capacity       | 6KV                                                                                                                                         |
| 20    | Sealing arrangement            | CAMR support sealing of SIM & CAMR device separately                                                                                       |
| 21    | Processor and memory           | Inbuilt ARM Processor and 4MB nonvolatile memory.                                                                                           |
| 22    | Reliability                    | Protection against Environment, EMI - EMC, Surge & AC Voltage etc                                                                          |